Effects of Active Labor Market Programs on the Transition Rate from Unemployment into Regular Jobs in the Slovak Republic

Lubyova, M.; van Ours, J.C.

Publication date:
1998

EFFECTS OF ACTIVE LABOR MARKET PROGRAMS ON THE TRANSITION RATE FROM UNEMPLOYMENT INTO REGULAR JOBS IN THE SLOVAK REPUBLIC[1]

Martina Lubyova
Slovak Academy of Sciences, Sancova 56, 813 64 Bratislava, Slovak Republic
Tinbergen Institute and CERGE-EI

Jan C. van Ours
CentER for Economic Research, Department of Economics, Tilburg University, 5000 LE Tilburg, The Netherlands, William Davidson Institute and CEPR

Mailing address for proofs: J. C. van Ours, CentER for Economic Research, Department of Economics, Tilburg University, P.O. Box 90153, 5000 LE Tilburg, The Netherlands

Abstract

The system of active labor market policies (ALMP) in the Slovak Republic consists to a large extent of the creation of socially purposeful and publicly useful jobs and of retraining of unemployed workers. So far, the effects of these types of active labor market policies have hardly been analyzed. This paper uses a unique administrative data from 20 Slovak districts to analyze to what extent it is beneficial for unemployed workers who want a regular job to accept a temporary ALMP-job or enter a retraining program. We find that indeed it is beneficial for workers to do so.

JEL classification numbers: J64, C41

[1] We are grateful for the financial support from the Volkswagen Foundation (Van Ours) and Phare Ace Program of the European Commission (Lubyova). We benefited from comments by Tito Boeri, Hartmut Lehmann, Bas van der Klaauw and the participants of the workshop "Labour Market Policies in Transition Countries: Monitoring and Evaluation" at Trinity College in Dublin, June 1998.

1. INTRODUCTION

The Slovak labor market ranks among the transitional labor markets of Central and Eastern Europe. It shares many features of these labor markets, but at the same time, it has specific features on its own. Typical common features are represented, for example, by the sharp initial increase of unemployment rate, the accommodation of excessive labor force by massive retirement of older workers and by the introduction of early retirement, the first tightening reforms of unemployment insurance systems, subsequent fluctuations within a trap of two-digit unemployment rate levels, the high share of long-term unemployed and relatively low outflows to jobs.

Among the specific Slovak features we name the frequent reforms of both the unemployment insurance system and the system of active labor market policies. Sometimes decision-makers took short-sighted options and subordinated labor market policies to budgetary considerations. Frequent institutional reforms provide grounds for examining the effects of these changes on the individual behavior at the labor market. This aspect of the Slovak labor market is used also in this paper.[2]

Like many other countries with a transitional economy, Slovakia underwent a sharp increase of unemployment at the initial stage of the transition. In the course of 1991, unemployment increased from practically zero to 300,000 persons which corresponded to an unemployment rate of about 12 % (OECD 1996). Since then the authorities have been fighting with double-digit unemployment rates that did not decline, as was originally hoped, at the later stages of the transition when the restructuring of the economy should have been completed to a large extent. During the seven years of transition, the unemployment rate has been fluctuating between 12 and 15%. At the end of the first quarter of 1998 the unemployment rate was about 12 %.

Slovak authorities have been very active in the field of institutional labor market reforms. The passive labor market policy underwent major reforms more often than in the other Central and Eastern Europe (CEE) countries. Unique was, for example, the loosening reform of unemployment insurance benefits in 1995 followed by some more relaxing steps. In 1997 the system was re-built again. Despite the fact that the aggregate level of unemployment proved to be slightly responsive to the unemployment insurance reforms (mostly after the tightening reform of 1992), the existing empirical research at the micro-level did not prove any substantial effects of passive policies on the individual duration of unemployment.

Ham, Svejnar and Terrell (1996) analyze micro data to investigate the incentive effects of the unemployment compensation system of Czecho-Slovakia before the split-up of the two countries in 1993. They find that unemployment benefits have a moderate to small effect on the duration of unemployment. Furthermore, they find that older workers, low educated workers, gypsies and handicapped have longer unemployment durations than other workers. Lubyova and Van Ours (1997) examine the effects of unemployment insurance (UI) reforms on the exit rates from unemployment. They find that the tightening and loosening reforms of unemployment insurance did not influence individual re-employment probabilities very much. Instead, the alternative exit state - out of labor force – seems to be more sensitive to the changes. Lubyova and Van Ours (1998a) investigate the possible disincentive effects on exits from unemployment provided by unemployment insurance and social assistance benefits. Although there were certain groups of unemployed identified for

[2] Another specific feature of Slovakia is its common past with the Czech Republic, due to which Slovakia is considered to be a useful reference point in investigating the puzzle of the extremely low Czech unemployment rate.

whom the potential labor income was comparable to the income from social assistance, the hazard function analysis based on micro-data from the Slovak LFS did not prove any disincentive effects. However, as the nature of LFS data did not allow an accurate measurement of the true individual replacement ratios, some proxies for the amount of social assistance received were used. From an additional analysis of LFS-data in which they distinguish between job losers and school-leavers, Lubyova and Van Ours (1998b) conclude that young, male, highly educated job losers and job losers living in low unemployment districts have higher exit rates to a job than their counterparts have. For unemployed school leavers the exit out of unemployment seems to be more or less a random process. Another main conclusion is that there are indications of a severe sort of unobserved heterogeneity among job losers. According to the estimates 85% of the Slovak job losers has a low job finding rate.

Simultaneously with the use of passive labor market programs the Slovak authorities implemented active labor market policies (ALMP) extensively. ALMP were introduced in 1991 and gradually developed into a comprehensive system of more than 8 basic types of programs. The last major reorganization occurred in 1997.

So far, not a lot of research has been done on the effects of the Slovak active labor market policies. The existing research is focused on the effects of ALMP spending on the overall outflow from unemployment. Burda and Lubyova (1995) examined the effectiveness of ALMP expenditures in the Czech and Slovak Republics. They find that the elasticities of unemployment outflow with respect to ALMP expenditures are positive and statistically significant, with the Slovak one being slightly higher than the Czech one. This result is confirmed by Boeri (1997a) who concludes that ALMP seem to have had an impact on outflows to jobs in most transition economies. In a recent study on the Polish labor market Puhani (1998) concludes that training increases re-employment chances of unemployed while subsidized jobs have a negative employment effect. According to Puhani the effects of Polish ALMP are larger in absolute size for men than for women. From an overview of studies on labor-market reforms in transition economics Boeri (1997b) concludes that active policies, such as subsidized employment schemes and public work programs have not been very successful. According to Boeri this may have to do with the phenomenon that slots in training courses are often offered to job seekers with rather favorable labor market characteristics who would have found a job anyway. Furthermore, participation in active labor market policy programs may stigmatize the participants, which will reduce their chances of finding a regular job.

The main purpose of this paper is to study the effects of active labor market policy programs in Slovakia more closely. We use the exit rate from unemployment to regular jobs as an indicator for the successfulness of these programs. We do not investigate the quality of the match between the worker and the job, nor do we investigate the length of new job spell. We use a sample of 20 Slovak districts of which we have very detailed labor market information with respect to the workers that started unemployment spell in 1993. We do separate analyses for males and females.

The paper is set up as follows. In section 2 we provide stylized facts about recent developments in Slovak unemployment and the system of active labor market policies. In section 3 we describe our data and the sampling procedure. In section 4 we discuss our statistical model and in section 5 our estimation results. Section 6 concludes.

2. UNEMPLOYMENT AND ACTIVE LABOR MARKET POLICIES

In the current paper we try to measure at the individual level the effects of subsidized job creation programs on exits from unemployment. The programs examined by us, known as socially purposeful jobs (SPJ) and publicly useful jobs (PUJ) form the major part of ALMP programs in Slovakia. We also consider retraining as an ALMP program.

ALMP were introduced in 1991 and gradually developed into a comprehensive system of more than 8 basic types of programs. The last major re-organization occurred in 1997. Until the end of 1996 the ALMP in Slovakia contained the following measures: socially purposeful jobs (SPJ), publicly useful jobs (PUJ), retraining, counseling, sheltered workplaces for the disabled, subsidies for shortened working hours and places for school-leavers. SPJ were the most important throughout the period, both in terms of number of created jobs and expenditures. They were followed by PUJ and retraining.

The Socially Purposeful Jobs program has been the most extensive one among Slovak ALMP programs both in terms of expenditures and participants. SPJ are subsidized jobs in the private sector. The concept of SPJ and the rules of administration have undergone numerous revisions as the authorities learned how to tailor the programs to labor market conditions. Back in March 1991 SPJ were considered to be every job created on the basis of an agreement with the labor office by an employer in production, business or other activities aimed at profit. In 1992 the profit-seeking requirement was eliminated and the requirement that the job had to be occupied by registered unemployed was introduced. The latter was partially relaxed in 1994 when the school-leavers, persons younger than 18 years and those who would be full-time self-employed under SPJ were allowed to participate without prior registration. The main forms of support introduced in 1991 were subsidies, interest repayments and loans, later reduced to 2-years loans and subsidies. The minimum duration of SPJ was introduced in 1992 and set to 2-years period. In case of lay-off or quit, the job should be occupied by another registered unemployed within 30 days. Stocks of SPJ were built up in the course of 1992 and stabilized afterwards. Generous spending before the end of 1992 resulted in a major inflow of almost 25 000 jobs. Another large inflow of about half that size occurred at the end of 1994.

Publicly useful jobs are public works (community works) designed mostly for lower qualified workers for a limited period of time. In 1991 PUJ were introduced as short-term employment opportunities created on the basis of agreement with labor office by an employer who is not in production, business or other activities aimed at profit (for example, organs of state administration, municipalities, local administration). The requirement for non-profit orientation of the employer was canceled in 1992. State budgetary organizations and state contributory (partial budgetary) organizations were excluded from PUJ programs in 1994. The upper limit for financial support was originally set at the wage costs of the participant, later extended to cover also participant's social insurance contributions. The maximum duration of PUJ in 1991 was 6 months. Given that the participation renewed unemployment benefit entitlement, many unemployed were shifting between PUJ and open unemployment. Therefore, the maximum duration of PUJ was raised to 9 months in 1994 and to 12 months in 1995. Stocks of jobs and participants in the program have reached merely one sixth of those of SPJ. The stocks were strongly built up after two major inflows of about the same size, which occurred in the financing boom of 1992 (together with the major SPJ inflow), and in the first half of 1995. The latter inflow was a result of changed priorities in 1995 - more means were put into PUJ, partly at the expense of other programs. Because of the limited duration of PUJ the stocks were not as stable as in the case of SPJ. After the large inflows the stocks were gradually depleted.

Retraining has been used relatively modestly. The share of total ALMP expenditures dedicated to retraining has been less than 10 % and it has a declining tendency. Where possible, retraining of employees in enterprises is preferred to retraining of unemployed by labor offices. The average share of unemployed in the total number of retrained persons was typically 60 to 70 %, the share of retrained persons in the total number of unemployed was typically less than 5 %. According to a survey organized at district labor offices by Duffner (1994), the average duration of a retraining course was 8 weeks, the overall range spanning 4 to 19 weeks. The rate of subsequent job-placement was, on average, 63 %, the range among districts reached from 35 to 85 %. This may be due to the ex-ante promise of job-placement required by many labor offices in the light of severe shortage of available vacancies.

In 1997 the structure of ALMP programs was substantially reformed. A new act on employment, effective since January 1997, stipulated the following ALMP measures: retraining, support of job creation, support of employment of specific target groups, support for prevention of layoffs, support for maintenance of existing jobs, support for elaborating proposals for revitalization of employment, support for employment of disabled. From the comparison of the two structures it is obvious that more attention is currently being paid to the measures of a preventive nature, as well as to targeting of the measures to specific groups (disabled, older people, long-term unemployed, young workers and school leavers). The original job creation programs (SPJ and PUJ) were formally unified into one program of job creation, although the distinction between the two types of jobs was preserved. SPJ were further diversified and targeted on specific groups of unemployed (SPJ in general, self-employment, jobs for school-leavers, special targeted program for long-term unemployed, persons older than 50 years, parents after prolonged maternity leave, and those to be laid-off for organizational reasons).

3. DATA

The data used in our analysis come from the unemployment registers of labor offices in 20 selected Slovak districts. Until the end of 1996, there were 38 districts in Slovakia. The administrative reform of 1997 increased the number of districts to 76. In our analysis we use data from 20 districts, which cover 33 % of total Slovak area and 38 % of the total population.[3] The selection of districts was made in order to cover all Slovak regions (see Figure 1). The sample contains both industrial centers and agricultural districts in the country. Characteristics of the selected districts are summarized in Table 1. Table 2 summarizes the numbers of created SPJ and PUJ in the sampled districts as compared to the Slovak totals. In the selected districts the data collection was exhaustive, i.e. all the registered unemployed were selected.[4]

<< Figure 1 about here >>
<< Table 1 about here >>
<< Table 2 about there >>

We use several types of information in order to reconstruct individual histories. An individual history consists of a sequence of spells representing three possible labor market

[3] With one exception (Pezinok) these districts also existed before 1997.
[4] Our sampling procedure corresponds to a one-stage cluster sampling.

states: employment, unemployment and out of labor force. In addition to that, we are able to identify the spells of participation in SPJ and PUJ programs.

The information about the last unemployment spell comes directly from the unemployment register, which contains also information about the personal characteristics of job applicants. Due to the overwriting of records in case of repeated registration, the unemployment register does not contain information on previous unemployment history. Therefore, we had to turn to unemployment archives in order to reconstruct the information on previous unemployment spells.

In addition to the unemployment information, we used separate files containing information about previous employment or OLF spells prior to every registration. Finally, we used information about dates and duration of SPJ and PUJ spells.

From the unemployment register and unemployment archives we selected an inflow sample of all the unemployed that became registered in the course of 1993. The censoring point for our sample was April 1998. By combining the four sources of information (unemployment register, unemployment archives, information on previous employment or OLF, and information on ALMP), we were able to obtain individual histories starting elsewhere in the past and ending at the above-mentioned censoring date. The use of 1993 inflow is justified by the relative stability in the institutional set-up of the labor market (major reforms occurred at the beginning of 1992 and 1995). Another reason was a sufficient time period elapsed before the censoring point in order to avoid large shares of censored spells.[5]

We obtained a sample of about 100,000 individuals who were in the 1993-unemployment inflow. We traced all other spells of these individuals. We sorted the spells chronologically in ascending order of their beginning and ending dates. In this way we obtained individual histories, typically beginning by the previous employment or OLF spell(s) prior to the first registration in unemployment register. Employment spells are by far the longest, mostly due to the long reported employment spells starting before 1989.

In our analysis we use information about the length of the first spell of unemployment that started in 1993 and if this spell ended about the labor market status after unemployment. If the spell ended in a transition to a job the unemployment spell was considered to be completed. If the spell ended in a transition to an ALMP-job or to training the unemployment duration was considered to be continued until another transition occurred either to a job or back to unemployment. When a transition to a job happened the unemployment spell was considered to be complete. When a transition occurred back to unemployment the spell was still considered to be incomplete. In the analysis we also considered the duration of unemployment up to a transition to an ALMP-job or to training to be important. This duration is the search period until an active labor market policy measure is met. If the spell did not end or ended in a transition to out of the labor force the unemployment spell is considered to be right censored. The sample characteristics for the 1993 unemployment inflow in the 20 sampled districts are presented in Appendix 2.

4. STATISTICAL MODEL

[5] In our previous research based on individual data from the Slovak unemployment register there was a trade-off between censoring and overwriting: the longer the time period observed, the smaller the share of censored spells was in the sample. At the same time, an increasing proportion of information was lost due to the overwriting of older spells by newer ones in case of repeated registration. In our current sample we eliminated the overwriting problem by using the archived information.

In order to establish the effect of ALMP-jobs and retraining on the exit rate from unemployment to a regular job we have to set-up a model that accounts for possible selectivity in the inflow into the programs of active labor market policy. In our model we exploit information with respect to the duration of unemployment, the duration of the stay in an ALMP-program and the destinations after that (see Lancaster (1990) for an overview of methods of duration analysis).

From an econometric point of view the problem we analyze is similar to that in Holm, Van den Berg and Van Ours (1998). In this paper an analysis is presented of a part of the Dutch medical system. In the Netherlands, to become a medical doctor, students with an undergraduate medical degree have to apply for a trainee position. While searching for a trainee position they may accept a temporary job as a medical assistant. The paper by Holm, Van den Berg and Van Ours (1998) uses a micro data set to investigate whether accepting such a temporary job speeds up the process of finding a trainee position. A major problem is the possible endogeneity of the temporary job, since the enrollment into such a job may be selective. To account for possible selectivity, they simultaneously model the transitions from unemployment to medical trainee, from unemployment to medical assistant, from medical assistant to medical trainee and from medical assistant to unemployment. By allowing for correlation between unobserved heterogeneity in the various transition rates they account for possible selectivity, which indeed turns out to be important. Overall, they find that a job as medical assistant is improving the speed by which medical undergraduates find a trainee position.

Other examples of the use of similar multivariate duration models are Abbring, Van den Berg and Van Ours (1997) and Van den Berg, Van der Klaauw and Van Ours (1998). In these studies the effect of benefit sanctions on the transition rate from unemployment to employment is modeled. Here too, the issue of selectivity is very important. Again, selectivity is accounted for by modeling both the exit rates out of unemployment and the rate by which unemployed get a sanction imposed and investigate the correlation between the unobserved heterogeneity terms. Both studies find a significant positive effect of benefit sanctions on the transition rate from unemployment to a job. In the study by Van den Berg, Van der Klaauw and Van Ours (1998) it is shown that if unobserved heterogeneity is not accounted for, no effect of sanctions is found.

In the multivariate duration models the variation in the durations at which treatment is administered to individuals, and data on the corresponding pre- and post-treatment durations can be exploited to identify the treatment effect. A formal proof of this is given in Abbring and Van den Berg (1998).

We use the same method of analysis as in the studies just mentioned. Our starting point is **Model 1**, a proportional hazard model with a flexible baseline hazard. Differences between unemployed individuals in the transition rate from unemployment to a job can be characterized by the observed characteristics x, the elapsed duration of unemployment itself, and a variable indicating whether or not the individual started participating in an ALMP-program. For the moment we do not distinguish between different programs, so an ALMP-program is either a PUJ, a SPJ or retraining. We assume x to be time-invariant. If t_a is the time at which the individual starts participating in an ALMP-program and $I(t_a<t)$ is the dummy variable indicating whether the individual has already started participating, the transition rate from unemployment to a job at time t conditional on x and t_a can be specified as follows:

$$\theta_j(t; x) = \lambda_j(t).\exp(x'\beta_j + \delta.I(t_a<t)) \qquad (1)$$

where λ_j (t) represent individual duration dependence and δ measures the effect that participation in an ALMP-program has on the transition rate from unemployment to a regular job. We model flexible duration dependence by using a step function

$$\lambda_j (t) = \exp(\Sigma_k(\lambda_{j,k} I_k(t)) \quad (2)$$

where k (= 1,..,4) is a subscript for time-intervals and $I_k(t)$ are time-varying dummy variables that are one in subsequent time-intervals. We distinguish four time intervals: 1-2 quarters, 3-4 quarters, 4-8 quarters and 8+ quarters. Because we also estimate a constant term, we normalize $\lambda_{j,1}=0$.

The basic assumption in Model 1 is that the inflow into the ALMP-program is a random process in the sense that it is independent of the process by which unemployed find jobs. The selection into the treatment-program is exogenous and does not depend on unobserved characteristics that also affect the job finding rate. In other words, conditional on observed characteristics and the duration of unemployment the quality of the unemployed flowing into ALMP is as good (or as bad) as the quality of the unemployed that remain unemployed. Then, if we measure an effect of an ALMP-program ($\delta \neq 0$), this is a 'true' effect. This effect could go both ways. If $\delta < 0$ the ALMP-program has a negative effect on the re-employment hazard, which could be caused by stigmatization. If $\delta > 0$ the ALMP-participants have a higher exit rate to a job than the non-participants. Note that in the specification of the hazard in equation (1) the effect of an ALMP-program occurs immediately. Later on we relax this assumption. Also note that we consider the duration of a stay in an ALMP-program as an extended unemployment duration. Our concept does not coincide with the official statistics but we take the point of view of labor economists: a person is unemployed until he or she finds a job or leaves the labor market.

The density of completed unemployment durations is simply:

$$f_j (t) = \theta_j(t; x) \exp({}_0\int^t \theta_j(s; x)\, ds) \quad (3)$$

In a similar way we model the transition rate to an ALMP-program at time t conditional on observed characteristics x as:

$$\theta_a(t; x) = \lambda_a (t).\exp(x'\beta_a) \quad (4)$$

where $\lambda_a (t) = \exp(\Sigma_k(\lambda_{a,k} I_k(t))$ and the normalization is $\lambda_{a,1}=0$. The density of completed duration of 'search' for an ALMP-program is equal to:

$$f_a (t) = \theta_a(t; x) \exp({}_0\int^t \theta_a(s; x)\, ds) \quad (5)$$

Then, the log-likelihood of Model 1 is specified as:

$$\mathcal{L} = d_1.\Sigma \log(f_j.(1-F_a)) + d_2.\Sigma \log(f_j.f_a) + d_3.\Sigma \log(1-F_j).f_a + d_4 \Sigma \log(1-F_j)(1-F_a) \quad (6)$$

where d_1 is a dummy variable with a value of 1 if the unemployed did not participate in an ALMP-program but still found a job, d_2 is a dummy variable with a value of 1 if the unemployed participated in an ALMP-program and then found a job, d_3 is a dummy variable with a value of 1 if the unemployed participated in an ALMP-program but did not find a job and d_4 is a dummy variable with a value of 1 if the unemployed neither

participated in an ALMP-program nor found a job. Note that we could have estimated the parameters of both hazard rates separately since the likelihood factorises.
In **Model 2** we allow for unobserved heterogeneity to affect the transitions to both a job and to ALMP-programs:

$$\theta_j(t; x, u) = \lambda_j(t).\exp(x'\beta_j + \delta.I(t_a) + u)$$
$$\theta_a(t; x, v) = \lambda_a(t).\exp(x'\beta_a + v) \qquad (7)$$

where u and v are the components of unobserved heterogeneity in the transition rates to a regular job and to an ALMP-program. Now we can allow for selectivity in the inflow into an ALMP-program. If the unobserved characteristics have a negative effect on the job finding rate and a positive effect on the transition rate to an ALMP-program, then conditional on the observed characteristics and the elapsed duration of unemployment the average quality of the workers in an ALMP-program is lower than the average quality of workers who do not enter an ALMP-program. Then, if we would simply compare the transition rates to regular jobs of both groups we would compare workers with unfavorable characteristics and ALMP-participation with workers with more favorable characteristics and non-ALMP-participation. Therefore, we would underestimate the true effect of participating in an ALMP-program. The opposite effect is also possible. One could imagine that the people in control of the ALMP-programs want their programs to be a success. Therefore they prefer workers with good characteristics to flow into their program. This would imply that there is a positive correlation between the unobserved heterogeneity components in both transition rate. Then, we would overestimate the effect of ALMP-programs.
We define G(u,v) to be the joint distribution of the unobserved characteristics u,v. Then, the joint density function of t_j, t_a conditional on x equals

$$f_{j,a}(t_j, t_a| x) = \int_u \int_v f_j(t_j | x, u, t_a)\, f_a(t_a| x, v)\, dG(u,v) \qquad (8)$$

We assume G to be a discrete distribution of unobserved heterogeneity with two points of support (u^a, v^a), (u^b, v^b). The associated probabilities are denoted as follows:

$$Pr(u = u^a, v=v^a) = p \qquad Pr(u = u^b, v=v^b) = 1-p \qquad (9)$$

where $0 \leq p \leq 1$. We modeled $p = \exp(\alpha)/(1+\exp(\alpha))$ to have a logit specification. The set-up of the likelihood is similar to the one presented in equation (6). However, because of the introduction of unobserved heterogeneity it is not possible to factorise the likelihood.

5. ESTIMATION RESULTS

5.1 Parameter estimates

We use data from 20 Slovak districts whose labor market characteristics are described in Tables 1 and 2. Of all the workers that started an unemployment spell in these districts in 1993 we have information with respect to the length of the spell, the destination after the spell, the length of the subsequent spell, et cetera. On the basis of this information we estimate the coefficients of the models presented in the previous section using the method of maximum likelihood. We do separate analyses for males and females.

The explanatory variables we use refer to age, education, marital status, ethnic group and district unemployment rate. (See Appendix 1 for a definition of the variables). We have a data set of about 100,000 individuals from which in order to reduce the computational burden we took a 10% random sample. After omitting individuals of which we lack information with respect to relevant variables, samples of 6651 males and 4970 females remain. Appendix 2 presents descriptive statistics for both samples. It turns out that males and females have a similar age distribution. About 35-40% of the workers is younger than 30 years. Furthermore, of the males 50% has a lower education and 30% has a secondary or higher education. On average the females are higher educated since 43% of them has secondary or higher education. About 50% of the male unemployed workers are married, while of the female unemployed workers about 65% are married. With respect to nationality both samples only differ slightly. About 4% of the unemployed are classified as Gypsy, and about 4% as Hungarian. Note however, that with respect to nationality there are big differences between the districts. Finally there is information about the way the unemployment spells ended. Of the males in our sample 47% ended unemployment by finding a job, while of 45% the unemployment spell was right censored. The remaining 8% of the males ended up in an ALMP-program. Of the females 40% found a job and 9% entered an ALMP-program. Of the remaining 51% of female unemployed workers the unemployment spell was right censored.

We estimate the parameters of models 1 and 2 using maximum likelihood. Table 3 presents the estimation results. As indicated in Section 4 we distinguish between two model specifications. Model 1 does not allow for possible unobserved heterogeneity in either of the transition rates. Differences between the two exit rates are due to differences in coefficients of observed characteristics of individuals. This implies that the inflow into ALMP-programs is assumed to be exogenous with respect to the direct flow from unemployment to a regular job. In Model 2 we introduce unobserved heterogeneity in both transition rates and we investigate whether there is correlation between the unobserved heterogeneity terms. If there is, then there is selectivity in the inflow into ALMP-programs. First we extensively discuss the estimation results for males, then we briefly discuss the estimation results for females focusing on differences with males.

<< Table 3 about here>>

For *males* it appears that unobserved heterogeneity is present. There are two groups of workers that differ both in terms of the transition rate to a job and in terms of the transition rate to an ALMP-program. We only know that they differ but we do not know the reason why. If we compare the estimation results of Models 1 and 2 we see that they improve substantially if unobserved heterogeneity is introduced. The two mass points of the unobserved heterogeneity distribution of the transition rate to a regular job are quite far apart, as are those of the transition rate to an ALMP-program. One group of about 10% of the workers has a very low transition rate to a regular job and a high transition rate to ALMP-programs. The other group of about 90% has a higher transition rate to a regular job and a substantially lower transition rate to an ALMP-program. Apparently, the selectivity of the inflow into an ALMP-program is very important.

Because of the perfect negative correlation of the unobserved heterogeneity terms it is easy to explain why we find a negative treatment effect in Model 1. Since in this model we assume that there is no selectivity we find that workers experience a decrease in their exit rate to a regular job once they enter an ALMP-program. In fact conditional on observed characteristics and the elapsed duration of unemployment workers that enter an ALMP-program have worse labor market characteristics than workers have that do not enter an ALMP-program. So, it is the selectivity that is responsible for the apparent negative treatment effect. In fact in Model 2 we find that the treatment effect is positive. So for unemployed workers entering an ALMP-program is beneficial. As soon as they have entered the ALMP-program their transition rate to a regular job increases with 150%.

With respect to a regular job, for males age is relevant since workers younger than 30 years have an exit rate to a job that is higher than that of their older colleagues. A somewhat surprising result is that unemployed workers with incomplete secondary education have a larger exit rate to a regular job than workers with either lower or higher education. It may be because vocational education, including lower vocational, is included in secondary. The fact that workers with vocational education have low re-employment probabilities in transition countries has been widely documented. Marital status also has a positive effect on the exit rate to a regular job. Furthermore, we find that both Gypsies and Hungarians have a smaller exit rate to a regular job. Finally, the unemployment rate has a negative effect. In districts with high unemployment rates the individual exit rates to a job are smaller than they are in districts with low unemployment rates. Duration dependence in the exit rate to a regular job is not very important since this rate stays sort of constant after 6 months of unemployment.

With respect to ALMP-programs the age of male workers is not important. Education is important. Males with secondary and higher education have a higher exit rate to ALMP-programs than males with a lower education have. Married males, Gypsies and Hungarians have similar exit rates to ALMP-programs than their counterparts, non-married males and Slovaks. Finally the unemployment rate has a positive effect. In districts with high unemployment rates the individual transition rates into ALMP-programs are larger than they are in districts with low unemployment rates. The transition rate to ALMP-programs increases over the duration of unemployment. The transition rate in the second half of the first year of unemployment is significantly higher than the transition rate in the first six months. In the second year there is again an increase in this transition rate.

Comparing the estimation results for the coefficients of the two transition rates it is striking that the signs are very similar. Lower educated and older unemployed are worse off for every exit state. So, the surprising result is that in terms of the observed characteristics of unemployed workers the ALMP-programs do not balance the effect of the ordinary labor market, but they seem to strengthen these effects. Those workers who have a better position when it comes to finding regular jobs are also in a better position to enter an ALMP-program.

For *females* to a large extent the estimation results are similar to those of the males. Unobserved heterogeneity is important for females as well. After accounting for this selectivity the size of the treatment effect for females is about the same as it is for males. The difference between the two mass points of the transition rate to a job is about the same, as is the difference between the two mass point of the transition to an ALMP program and the distribution of unobserved heterogeneity. Therefore, also for females selectivity is a very important phenomenon we have to account for in order to get unbiased estimates of the treatment effect. It appears that married females and Hungarian females have no

different job finding rate than their counterparts have. Finally, female Gypsies and Hungarians have a smaller transition rate to ALMP-programs.
We also investigated whether conditional on the other observed characteristics there is a differences between the transition rates for males and females. It turns out that there are no difference in transition rate into ALMP-programs. However, on average male unemployed workers do have a higher transition rate from unemployment to a job than female unemployed workers have.

5.2 Sensitivity analysis

So far, the analysis has its limitations. First, we assume that the effect of ALMP is instantaneous and everlasting. In other words, we do not allow for duration dependence of the treatment effect. Second, we do not distinguish between different types of treatment effects. In particular we do not distinguish between SPJ, PUJ and retraining. Third, we assume that the differences between districts are sufficiently covered by the district unemployment rate. However, it could be that other determinants are relevant as well. In this section we present the results of sensitivity analyses that address each of these limitations. Each alternative model is an adapted version of Model 2.
In **Model 3** we investigate whether the treatment effect is constant over the duration of the stay in an ALMP-program. It could be that unemployed workers stay some sort of minimum time in a program so that the exit rate to a regular job is zero during the initial period and positive afterwards. Then, the size of the treatment effect increases of the duration of the treatment. Or, it could be that workers get stigmatized if they stay in a program too long so that the exit rate to a regular job, and thus the treatment effect decreases over time. We investigate the possibility of duration dependence in the treatment effect by allowing the effect of the ALMP-program to change over time:

$$\delta(t) = \delta_1 \, . \, d_{<6}(t) + \delta_2 . (1 - d_{<6}(t)) \qquad (10)$$

where $d_{<6}$ is a dummy variable with a value of 1 if the duration of stay in the ALMP-program is less than 6 months. So, we allow the effect of the ALMP-program to be different after 6 months. The estimation results of Model 3 are shown in Table 4a for males and Table 4b for females.

<< Table 4 about here>>

From a likelihood ratio test on the estimation results of Models 2 and 3 it appears that both for males and females we cannot reject the hypothesis that the treatment effect changes over the duration of the stay in the ALMP-program. However, the estimated size of the treatment effect hardly differs between the two time periods. For males the effect is somewhat smaller after 6 months, for females there is a slight increase. Note that the other coefficients of Model 3 are virtually the same as those of Model 2. Therefore, we conclude that duration dependence of the treatment effect is hardly relevant.
In **Model 4** we allow for differences between types of ALMP-program. In theory the transition rates to each of the different types of program may differ in all of its components. That is, it may be that the effect of observed characteristics, duration dependence and unobserved characteristics is destination specific. Furthermore, the structure of correlations between the different unobserved components can be quite complex. We leave this

extensive analysis of differences between ALMP programs for future research. Here, we assume that the only difference between the distinguished destinations concerns the size of the treatment effect:

$$\delta = \delta_{spj} \cdot d_{spj} + \delta_{puj} \cdot d_{puj} + \delta_{train} \cdot d_{train} \qquad (11)$$

where d_{spj} is a dummy variable with the value with of one if the treatment consists of an SPJ, d_{puj} is a dummy variable with the value with of one if the treatment consists of an PUJ and d_{train} is a dummy variable with the value with of one if the treatment consists of retraining. The second columns of Tables 5a and 5b show the estimation results. First note that for males the coefficients of the observed characteristics, of the duration dependence and of unobserved heterogeneity are hardly affected by the distinction in type of treatment. This indicates that as a first approximation the assumptions underlying Model 4 are not that bad. Second, and most important it turns out that the size of the treatment effect is very much dependent on the type of treatment. While the effect of training and publicly useful jobs is positive, the effect of socially purposeful jobs is negative. For females we find that the introduction of destination specific treatment effects influences both the duration dependence of the job finding rate and the mixing distribution. This indicates that the timing of events may be different for different destinations. Nevertheless, also for females we find that the effect of retraining is most positive and the effect of SPJ is most negative. Comparing the results of males and females we see that the absolute size of the treatment effect is smaller for females than it is for males.

In **Model 5** we use fixed effects for each of the districts in our sample. This means that we have to omit the district unemployment rate as explanatory variable since this variable only has cross-sectional variation. With a few exceptions we find that the introduction of fixed district effects does not influence our estimation results. One of the exceptions is the effect of being Hungarian on the transition rate to a regular job. This negative effect disappears after the introduction of the fixed effects which is an indication that differences between districts are relevant here. For females we hardly find any differences after the introduction of the district fixed effects. The overall estimation results as measured by the value of the loglikelihood improve substantially when district fixed effects are introduced. This indicates that the district unemployment rate only partly covers relevant differences between districts. However, the estimated coefficients and especially the estimated treatment effect hardly change.

6. CONCLUSIONS

The system of active labor market policies in the Slovak Republic consists to a large extent of the creation of socially purposeful and publicly useful jobs and of retraining of unemployed workers. ALMP-jobs are intended for unemployed workers to get them out of unemployment, give them additional work experience and get them to find a regular job more easily. Retraining activities are intended to improve and adapt the skills of unemployed workers. So far, the effects of these types of active labor market policies have hardly been investigated. This paper attempts to measure these effects. We use data from various administrative files to describe the outflow from unemployment into regular jobs and into ALMP-programs, and the outflow from these programs to regular jobs. We investigate to what extent it is beneficial for unemployed workers who want a regular job to accept a temporary ALMP-job or enter a retraining program.

The main issue in an evaluation study of this kind is the possible endogeneity of the inflow into the treatment program. It could be that unemployed workers that flow into an ALMP-program have unobserved characteristics that are different from those that do not. If for example ALMP-participants are less able to find a regular job than otherwise identical non-ALMP participants, then a straightforward comparison of the two groups in terms of transition rates to regular jobs would lead to an underestimation of the effect of an ALMP-program. To account for this type of selectivity we estimate transition rate models that allow both rates to be interdependent.

Our estimation results indicate that female, lower educated and older unemployed workers have a worse labor market position, both in terms of the speed with which they find regular jobs as in terms of the speed with which they enter ALMP-programs. The latter type of jobs is indeed especially for long term unemployed. One of the striking results of our analysis is that there are hardly any variables that discriminate between the two exit states. It seems the case that those workers who have a better position when it comes to finding regular jobs are also in a better position to find SPJ or PUJ. The jobs created by active labor market policies seem to be complementary to the regular labor market rather than compensating for bad labor market characteristics.

It turns out that unobserved heterogeneity and therefore selectivity is important in the transition processes. For both males and females there are two groups of apparently identical individuals that have different transition rates to both regular jobs and ALMP-programs. There is one group of workers of about 10% that has a low transition rate to a regular job and a high transition rate to an ALMP-program. Another group of unemployed workers of about 90% has a higher transition rate to a regular job and a low transition rate to an ALMP-program. Selectivity in the transition to ALMP-programs does appear to be a very important phenomenon. For both males and females we find that if we do not account for selectivity we get a negative treatment effect of ALMP-programs. Then, we would erroneously conclude that entering an ALMP-program stigmatizes individuals. If we account for selectivity in the inflow into ALMP-programs we find that workers that enter these programs benefit from it. After entering an ALMP-program the exit rate to a regular job increases with 150%. From an additional sensitivity analysis we conclude that this effect is mainly due to the positive effect of retraining and publicly useful jobs. For socially purposeful jobs we find a negative effect on the transition rate from unemployment to a job.

References

Abbring, Jaap H., Van den Berg, Gerard J., and Van Ours, Jan C., "The Effect of Unemployment Insurance Sanctions on the Transition Rate from Unemployment to Employment", *Working Paper Tinbergen Institute*, Amsterdam/Rotterdam, 1997.

Abbring, Jaap H. and Van den Berg, Gerard J., "The Non-Parametric Identification of Treatment Effects in Duration Models", *mimeo*, Vrije Universiteit Amsterdam.

Boeri, Tito, "Learning from Transition Economies: Assessing Labor Market Policies across Central and Eastern Europe", *Journal of Comparative Economics*, 26, 366-384, 1997.

Boeri, Tito, "Labor-market Reforms in Transition Economies", *Oxford Review of Economic Policy*, 13, 126-140, 1997.

Burda, Michael and Lubyova, Martina, "The Impact of Active Labor Market Policies: A Closer Look at the Czech and Slovak Republics", in*: Tax and Benefit Reform in Central and Eastern Europe*, ed. by David M.G. Newbery, Center for Economic Policy Research, London, 1995.

Duffner, M., "Evaluation of Retraining Policy in the Slovak Republic", *Phare Programme of the Ministry of Labor, Social Affairs and Family of SR*, Bratislava, 1994.

Ham, John C., Svejnar, Jan, and Terrell, Katherine, "Unemployment, the Social Safety Net en Efficiency in Transition: Evidence from Micro Data on Czech and Slovak Men", University of Michigan Business School, Davidson Institute *Working Paper*, 1996.

Holm, Anders, Van den Berg, Gerard J., and Van Ours, Jan C., "The Effect of Temporary Jobs on the Inflow Rate into Jobs with Educational Training for Physicians", *mimeo* CentER for Economic Research, Tilburg University.

Lancaster, Tony, *The Econometric Analysis of Transition Data*, Cambridge, Cambridge University Press, 1990.

Lubyova, Martina, and Van Ours, Jan C., "Unemployment Dynamics and the Restructuring of the Slovak Unemployment Benefit System", *European Economic Review*, 41, 925-934, 1997.

Lubyova, Martina, and Van Ours, Jan C., "Work Incentives and Other Effects of the Transition to Social Assistance: Evidence from the Slovak Republic", *Empirical Economics*, 23, 1/2: 121-154, 1998a.

Lubyova, Martina, and Van Ours, Jan C., "Unemployment Durations of Job Losers in a Labor Market in Transition", *Discussion Paper* CentER for Economic Research no. 9839, Tilburg University, 1998b.

Organization for Economic Co-operation and Development, *Labor Market and Social Policies in the Slovak Republic*, Paris: OECD, 1996.

P.A. Puhani, "Advantage through Training? A Microeconomic Evaluation of the Employment Effects of Active Labor Market Programs in Poland", *ZEW-Discussion Paper* no. 98-25, Mannheim, 1998.

Van den Berg, Gerard J., Van der Klaauw, Bas, and Van Ours, Jan C., "Punitive Sanctions and the Transition Rate from Welfare to Work", *Discussion Paper* CentER for Economic Research no. 9856, Tilburg University, 1998.

Appendix 1- Definition and means of variables
All variables are dummy variables (with value 1 where indicated and value 0 for the reference group)

Definitions of variables

Age<30: age is below 30 years as measured in 1998
Reference group age: age is 30 years or more in 1998

Incomplete secondary education
Secondary and higher education (including university)
Reference group education: no education - basic education – apprentice

Married: married or cohabiting person
Reference group marital status: single-divorced – widow/widower - unknown

Gypsies
Hungarians
Reference group ability: others

Urate: natural logarithm of the average district unemployment rate in 1992

Appendix 2- Descriptive characteristics of the 1993 inflow sample from the 20 Slovak districts

Means of variables *(Number of observations)*	**Males** *(6651)*	**Females** *(4970)*
Age < 30	0.38	0.36
Age ≥ 30	0.62	0.64
Lower education 0.49	0.42	
Incomplete secondary educ	0.23	0.15
Secondary and higher educ	0.28	0.43
Married	0.51	0.64
Other marital status	0.49	0.36
Gypsies	0.04	0.03
Hungarians	0.05	0.05
Others	0.91	0.92
Fist state after unemployment		
Job	0.47	0.40
SPJ	0.03	0.03
PUJ	0.03	0.02
Retraining	0.02	0.04
Censored	0.45	0.51
Total	1.00	1.00

Table 1
Main characteristics of the sampled districts and comparison with Slovak totals

		Area	Population	Econ. active	Population	Unempl.
				population	density	rate
		[sq. km]	[ths.]	[ths.]	[pers./sq.km]	[%]
SLOVAK TOTAL		49034	5379	48,4	109	13,44
SAMPLE:		Area	Population	Share of	Population	Unempl.
20 DISTRICTS				econ. active	density	rate
	Reg.	[sq. km]	[ths.]	population	[pers./sq.km]	[%]
Bratislava 1	BA	10	48	46,4%	4918	3,85
Bratislava 5	BA	94	130	57,2%	1381	4,08
Pezinok	BA	375	53	49,1%	142	5,39
Prievidza	TN	960	141	47,9%	147	10,67
Trencin	TN	675	114	47,4%	168	4,79
Nitra	NR	871	163	50,4%	187	10,00
Nove Zamky	NR	1347	152	48,7%	113	17,33
Cadca	ZA	760	92	43,7%	121	14,09
Dolny Kubin	ZA	490	39	44,2%	79	12,91
Martin	ZA	736	98	53,3%	133	9,76
Zilina	ZA	815	156	49,1%	192	9,11
Banska Bystrica	BB	809	113	52,4%	140	6,07
Rimavska Sobota	BB	1471	82	45,9%	56	29,83
Bardejov	PO	937	75	47,4%	80	19,26
Poprad	PO	1123	102	47,0%	91	15,54
Presov	PO	934	159	46,2%	170	15,40
Vranov n. Toplou	PO	769	74	39,0%	97	23,87
Michalovce	KE	1109	108	44,6%	97	20,00
Roznava	KE	1173	61	53,7%	52	21,35
Spisska N. Ves	KE	587	90	48,2%	153	19,92
TOTAL SAMPLE		16045	2050	48%	426	13,66
Share of Slovak total		33%	38%			

Table 2
ALMP - subsidized job creation in the sampled districts (as % of Slovak total)

	SPJ inflow			PUJ inflow		
	1993	1994	1995	1993	1994	1995
SR total jobs	35 945	38 983	46 866	13 331	16 084	44 342
of which %						
Bratislava 1 [a]	4,6	0,0	3,5	0,8	1,0	1,3
Bratislava 5 [a]	4,6	0,0	3,5	0,8	1,0	1,3
Pezinok [b]	-	-	-	-	-	-
Prievidza	1,0	2,4	3,0	3,0	3,3	3,8
Trencin	5,2	1,8	1,7	6,3	3,9	1,8
Nitra	4,6	3,8	2,3	0,1	2,1	3,0
Nove Zamky	5,1	2,9	2,2	3,2	3,5	4,1
Cadca	3,3	6,6	1,8	6,1	1,7	1,8
Dolny Kubin	1,8	2,2	2,0	4,6	5,9	3,2
Martin	1,3	1,8	1,7	1,2	0,9	1,8
Zilina	1,8	1,3	2,1	2,3	1,9	1,5
Banska Bystrica	2,7	0,2	1,6	1,4	2,4	1,9
Rimavska Sobota	2,0	2,3	5,0	1,9	2,1	5,7
Bardejov	1,8	2,1	1,8	3,3	3,6	3,0
Poprad	1,9	3,7	3,3	1,9	4,1	3,9
Presov	5,7	8,2	3,5	5,9	3,3	2,9
Vranov nad Toplou	1,1	2,2	1,6	1,8	2,0	2,7
Michalovce	2,9	3,6	2,6	1,7	3,9	2,1
Roznava	2,0	2,3	2,9	1,8	2,7	2,7
Spisska N. Ves	2,3	2,9	4,7	1,8	4,2	3,7

Source: Ministry of Labor, Social Affairs and Family of SR
[a] Totals for Bratislava
[b] The district did not exist before 1997

Table 3
Estimation results: hazard rates to regular jobs and to ALMP-jobs and training (t-values in parentheses)

	MALES		FEMALES	
	Model 1	**Model 2**	**Model 1**	**Model 2**
Regular job				
Age <30	0.12 (3.0)*	0.12 (2.6)*	0.05 (0.9)	0.10 (1.8)
Incomplete Sec. education	0.07 (1.6)	0.14 (2.9)*	0.03 (0.4)	0.06 (0.9)
Secondary and higher educ.	0.04 (1.0)	0.02 (0.3)	-0.02 (0.5)	-0.06 (1.1)
Married	0.31 (8.0)*	0.33 (7.8)*	-0.07 (1.5)	-0.07 (1.3)
Gypsy	-0.61 (5.9)*	-0.70 (6.5)*	-0.68 (4.9)*	-0.71 (5.1)*
Hungarian	-0.24 (2.7)*	-0.26 (2.7)*	-0.17 (1.7)	-0.10 (0.9)
Urate/10	-0.12 (2.6)*	-0.11 (2.1)*	-0.19 (3.2)*	-0.21 (3.2)*
Mass points				
u^a	-2.81 (38.9)*	-2.73 (33.2)*	-2.77 (30.2)*	-2.69(26.9)*
u^b	-	-6.45 (24.1)*	-	-5.70(15.7)*
Duration dependence				
3-4 Quarters	-0.37 (7.7)*	-0.36 (7.4)*	-0.20 (3.6)*	-0.21 (3.8)*
4-8 Quarters	-0.48 (9.5)*	-0.49 (9.3)*	-0.41 (6.8)*	-0.45 (7.5)*
8+ Quarters	-0.44 (7.4)*	-0.21 (3.1)*	-0.79 (10.3)*	-0.61 (7.9)*
ALMP-job & training				
Age <30	0.06 (0.6)	0.07 (0.6)	0.18 (1.4)	0.18 (1.2)
Incomplete Sec. education	0.22 (1.9)	0.24 (1.7)	0.50 (2.9)*	0.65 (3.9)*
Secondary and higher educ.	0.27 (2.5)*	0.47 (3.7)*	0.96 (6.8)*	1.17 (8.4)*
Married	-0.06 (0.6)	-0.11 (0.9)	0.01 (0.1)	0.05 (0.3)
Gypsy	-0.40 (2.2)*	-0.14 (0.6)	-0.98 (2.9)*	-1.08 (2.7)*
Hungarian	-0.36 (1.8)	-0.25 (1.0)	-0.50 (1.9)*	-0.80 (2.5)*
Urate/10	0.28 (2.5)*	0.34 (2.7)*	-0.07 (0.6)	0.00 (0.0)
Mass points				
v^a	-5.77 (29.0)*	-6.52 (27.0)*	-6.13 (24.5)*	-6.99(20.7)*
v^b	-	-4.34 (17.6)*	-	-4.56(14.0)*
Duration dependence				
3-4 Quarters	0.27 (1.9)	0.19 (1.3)	0.74 (4.6)*	0.75 (4.6)*
4-8 Quarters	0.97 (8.1)*	0.86 (6.7)*	1.19 (7.9)*	1.27 (7.5)*
8+ Quarters	1.52 (12.1)*	1.51 (9.2)*	1.80 (11.9)*	2.17(10.8)*
Treatment effect				
Average (δ)	-1.43 (22.3)*	0.92 (7.2)*	-0.95 (11.7)*	0.86 (6.2)*
Unobs. het. probability				
α	-	2.17 (18.5)*	-	2.50(14.6)*
Loglikelihood	-16678.5	-16522.8	-11855.5	-11777.1

* = significantly different from zero at 5%-level of significance

Table 4a
Estimation results; sensitivity analysis males (t-values in parentheses)

	Model 3	**Model 4**	**Model 5**
Regular job			
Age <30	0.12 (2.6)*	0.12 (2.6)*	0.10 (2.3)*
Incomplete Sec. education	0.14 (2.9)*	0.14 (2.7)*	0.24 (4.6)*
Secondary and higher educ.	0.02 (0.4)	0.03 (0.7)	0.08 (1.8)
Married	0.34 (7.8)*	0.36 (8.0)*	0.30 (7.1)*
Gypsy	-0.70 (6.5)*	-0.77 (6.9)*	-0.58 (5.3)*
Hungarian	-0.26 (2.7)*	-0.29 (2.9)*	-0.12 (1.1)
Urate/10	-0.11 (2.0)*	-0.10 (1.8)	-
Mass points			
u^a	-2.73 (32.9)*	-2.71 (31.4)*	-2.95 (15.3)*
u^b	-6.13 (17.8)*	-5.33 (19.8)*	-6.49 (21.1)*
Duration dependence			
3-4 Quarters	-0.35 (7.3)*	-0.33 (6.9)*	-0.33 (7.0)*
4-8 Quarters	-0.48 (9.2)*	-0.43 (7.8)*	-0.46 (8.8)*
8+ Quarters	-0.19 (2.8)*	-0.05 (0.6)	-0.22 (3.7)*
ALMP-job & training			
Age <30	0.06 (0.5)	0.08 (0.7)	0.11 (0.8)
Incomplete Sec. education	0.23 (1.6)	0.20 (1.5)	0.04 (0.2)
Secondary and higher educ.	0.44 (3.5)*	0.30 (2.6)*	0.46 (3.4)*
Married	-0.11 (1.0)	-0.13 (1.2)	-0.05 (0.4)
Gypsy	-0.15 (0.6)	-0.11 (0.5)	-0.47 (1.8)
Hungarian	-0.25 (1.0)	-0.20 (0.9)	-0.18 (0.6)
Urate/10	0.34 (2.7)*	0.34 (2.8)*	-
Mass points			
v^a	-6.49 (26.6)*	-6.40 (26.3)*	-5.87 (10.6)*
v^b	-4.40 (17.6)*	-4.70 (19.2)*	-3.19 (5.8)*
Duration dependence			
3-4 Quarters	0.18 (1.3)	0.16 (1.1)	0.24 (1.6)
4-8 Quarters	0.85 (6.7)*	0.79 (6.4)*	1.03 (7.1)*
8+ Quarters	1.47 (9.1)*	1.24 (9.1)*	1.88 (10.6)*
Treatment effect			
Average (δ)	-	-	0.84 (6.5)*
< 6 months (δ_1)	0.94 (6.6)*	-	-
> 6 months (δ_2)	0.58 (1.9)	-	-
SPJ	-	-0.36 (1.6)	-
PUJ	-	0.85 (3.6)*	-
Retraining	-	2.57 (8.4)*	-
Unobs. het. probability			
α	2.14 (16.3)*	1.72 (12.0)*	2.30 (22.5)*
Fixed district effects	no	no	yes
Loglikelihood	-16520.4	-16473.8	-16382.9

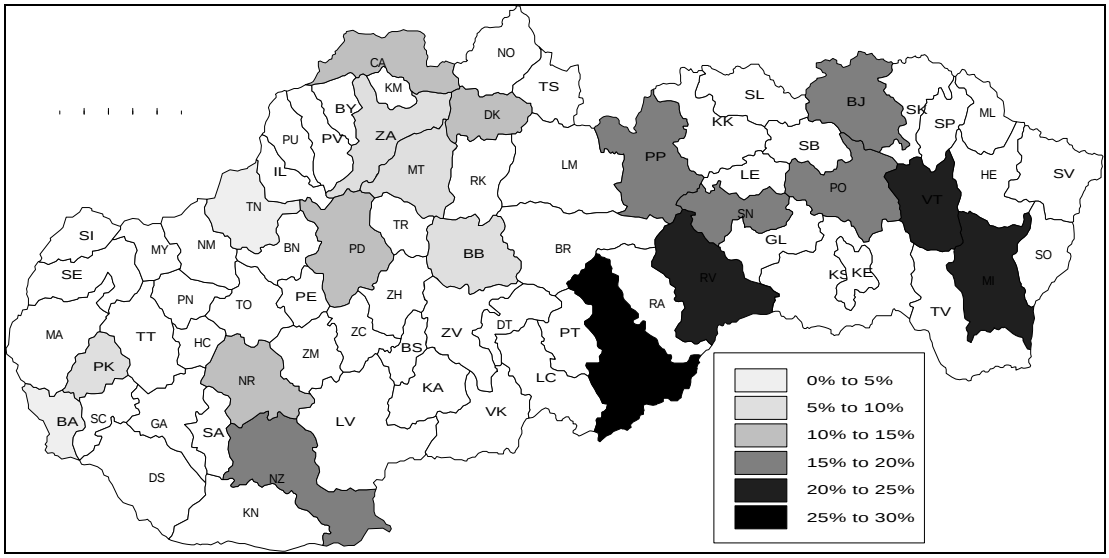
* = significantly different from zero at 5%-level of significance

Table 4b
Estimation results; sensitivity analysis females (t-values in parentheses)

	Model 3	**Model 4**	**Model 5**
Regular job			
Age <30	0.10 (1.8)	0.06 (0.9)	0.10 (1.8)
Incomplete Sec. education	0.06 (0.9)	0.03 (0.3)	0.08 (1.1)
Secondary and higher educ.	-0.06 (0.1)	-0.12 (1.9)	-0.04 (0.8)
Married	-0.07 (1.3)	-0.11 (1.6)	-0.09 (1.5)
Gypsy	-0.71 (5.1)*	-0.95 (5.3)*	-0.69 (4.8)*
Hungarian	-0.10 (0.9)	-0.22 (1.6)	-0.01 (0.1)
Urate/10	-0.20 (3.2)*	-0.21 (2.6)*	-
Mass points			
u^a	-2.70 (27.0)*	-1.85 (9.3)*	-3.14 (15.1)*
u^b	-5.80 (14.7)*	-3.71 (14.2)*	-6.13 (17.0)*
Duration dependence			
3-4 Quarters	-0.20 (3.6)*	0.00 (0.1)	-0.19 (3.4)*
4-8 Quarters	-0.46 (7.6)*	0.04 (0.3)	-0.43 (7.0)*
8+ Quarters	-0.62 (7.9)*	0.19 (0.9)	-0.60 (7.5)*
ALMP-job & training			
Age <30	0.18 (1.2)	0.19 (1.4)	0.28 (1.7)
Incomplete Sec. education	0.65 (3.2)*	0.50 (2.9)*	0.53 (2.4)*
Secondary and higher educ.	1.16 (8.1)*	0.98 (8.5)*	1.19 (7.5)*
Married	0.04 (0.3)	0.03 (0.2)	0.15 (0.9)
Gypsy	-1.07 (2.7)*	-0.90 (2.6)*	-1.24 (2.9)*
Hungarian	-0.79 (2.5)*	-0.47 (1.8)	-1.09 (3.4)*
Urate/10	-0.00 (0.0)	0.05 (0.4)	-
Mass points			
v^a	-6.97 (21.3)*	-7.09 (8.5)*	-6.28 (13.9)*
v^b	-4.56 (14.0)*	-5.93 (21.0)*	-3.79 (8.6)*
Duration dependence			
3-4 Quarters	0.75 (4.6)*	0.65 (3.9)*	0.78 (4.5)*
4-8 Quarters	1.27 (7.6)*	1.03 (5.9)*	1.34 (7.4)*
8+ Quarters	2.15 (11.0)*	1.57 (7.8)*	2.20 (10.2)*
Treatment effect			
Average (δ)	-	-	0.90 (6.2)*
< 6 months (δ_1)	0.85 (5.8)*	-	-
> 6 months (δ_2)	0.95 (4.2)*	-	-
SPJ	-	-1.43 (5.8)*	-
PUJ	-	0.50 (1.6)	-
Retraining	-	1.81 (7.3)*	-
Unobs. het. probability			
α	2.52 (14.9)*	-0.47 (1.4)	2.29 (15.1)*
Fixed district effects	no	no	yes
Loglikelihood	-11772.6	-11733.9	-11679.3

* = significantly different from zero at 5%-level of significance

Figure 1
Twenty Slovak districts included in the sample and the local unemployment rates



List of the selected districts:

BA Bratislava 1	MT Martin
BA Bratislava 5	BB Banska Bystrica
PK Pezinok	RS Rimavska Sobota
TN Trencin	BJ Bardejov
PD Prievidza	PP Poprad
NR Nitra	PO Presov
NZ Nove Zamky	VT Vranov nad Toplou
CA Cadca	MI Michalovce
ZA Zilina	SN Spisska Nova Ves
DK Dolny Kubin	RV Roznava